WHAT IS CLAIMED IS:

1. A method for operating a gas-generation device for generating a hydrogen-rich gas from at least one of partial oxidation of an oxygen/fuel mixture or catalytic steam reforming of a water/fuel mixture, said method comprising:

metering a fuel into a partial oxidation reactor;

starting combustion of the fuel by metering in oxygen-containing gas into the partial oxidation reactor, wherein a quantity of oxygen-containing gas corresponds at most to the stoichiometric ratio for complete fuel conversion;

heating at least the partial oxidation reactor of the gas-generation device by heat from said combusting;

reducing the quantity of the oxygen-containing gas and metering in water when an operating temperature for the partial oxidation reactor is reached, wherein at least one of a quantitative flow of the oxygen-containing gas or of the water is set such that an oxygen/fuel/water mixture is converted into hydrogen as completely as possible; and

further reducing the quantity of the oxygen-containing gas when the operating temperature of a downstream steam reformer is reached, so that only partial conversion of the fuel takes place in the partial oxidation reactor, and a remaining part of the fuel is converted in the downstream steam reformer.

2. A method according to Claim 1, wherein, when the operating temperature of the steam reformer is reached, the supply of the oxygen-containing gas is interrupted.

3. A method according to Claim 1, further comprising heating the steam reformer.

4. A method according to Claim 1, further comprising:

passing product gas that is generated in the partial oxidation reactor (1) through an adiabatic, catalytic after-treatment stage; and

converting unburnt parts of the fuel/oxygen mixture or of the fuel/oxygen/water mixture of the product, thereby minimizing an oxygen content in the product gas before it is fed to the steam reformer.

5. A gas-generation device for generating a hydrogen-rich gas from at least one of partial oxidation of an oxygen/fuel mixture or catalytic steam reforming of a water/fuel mixture, comprising:

a partial oxidation reactor;

a steam reformer downstream of the partial oxidation reactor;

an adiabatic, catalytic after-treatment stage arranged between the partial oxidation reactor and the steam reformer.

6. A device according to Claim 5, wherein the catalytic after-treatment stage comprises a precious metal-containing catalyst.

7. A device according to Claim 5, wherein the catalytic after-treatment stage comprises a catalyst support having a low heat capacity.

8. A device according to Claim 5, further comprising heating means for heating at least one of the steam reformer or the adiabatic, catalytic after-treatment stage.

9. A device according to Claim 5, wherein the adiabatic catalytic after-treatment is integrated into the partial oxidation reactor or the steam reformer.